

IN THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

Claims 1-19 (Cancelled).

20. (Previously Presented) An isolated nucleic acid molecule encoding a delta 12-fatty acid epoxygenase enzyme comprising a member selected from the group consisting of:

- (a) the nucleic acid molecule having the sequence of SEQ ID NO:1; and
- (b) the complement of an isolated nucleic acid molecule which hybridizes under high stringency conditions to a nucleotide sequence having the sequence of SEQ ID NO:1, wherein said nucleic acid molecule encodes a protein having at least 90% identity to SEQ ID NO:2 and wherein said protein has epoxygenase activity.

21. (Previously Presented) The isolated nucleic acid molecule of claim 1 wherein said nucleic acid molecule encodes a protein having at least 95% identity to SEQ ID NO:2 and wherein said protein has epoxygenase activity.

22. (Previously Presented) The isolated nucleic acid molecule of claim 1 wherein said nucleic acid molecule encodes a protein having at least 98% identity to SEQ ID NO:2 and wherein said protein has epoxygenase activity.

23. (Currently Amended) ~~The isolated nucleic acid molecule according to claim 20~~
An isolated nucleic acid molecule encoding a delta 12-fatty acid epoxygenase enzyme
comprising a member selected from the group consisting of:

- (a) the nucleic acid molecule having the nucleotide sequence of SEQ ID NO:1; and
- (b) the complement of an isolated nucleic acid molecule which hybridizes under high stringency conditions to a nucleotide sequence having the sequence of SEQ ID NO:1
wherein said nucleic acid molecule encodes a protein having the sequence of SEQ ID
NO:2 and wherein said protein has epoxygenase activity.

24. (Cancelled).

25. (Previously Presented) A chimeric gene comprising the isolated nucleic acid molecule of claim 20 operably linked to at least one regulatory sequence that allows the expression of the nucleic acid in a host cell.

26. (Previously Presented) The chimeric gene according to claim 25 wherein the at least one regulatory sequence allows expression of the nucleic acid in a bacterial, fungal insect or plant seed cell.

27. (Previously Presented) The chimeric construct according to claim 25 wherein the at least one regulatory sequence is the phaseolin promoter.

28. (Previously Presented) A vector comprising the chimeric construct according to claim 25.

29. (Previously Presented) An isolated host cell comprising:

- (a) an isolated nucleic acid molecule having the sequence of SEQ ID NO:1;
- (b) the complement of an isolated nucleic acid molecule which hybridizes under high stringency conditions to a nucleotide sequence having the sequence of SEQ ID NO:1, wherein said nucleic acid molecule encodes a protein having at least 90% identity to SEQ ID NO:2 and wherein said protein has epoxygenase activity, and at least one regulatory sequence that allows the expression of the complement in the host cell;
- (c) a vector comprising an isolated nucleic acid molecule having the sequence of SEQ ID NO:1, or
- (d) a vector comprising the complement of an isolated nucleic acid molecule which hybridizes under high stringency conditions to a nucleotide sequence having the sequence of SEQ ID NO:1, wherein said nucleic acid molecule encodes a protein having at least 90% identity to SEQ ID NO:2 and wherein said protein has epoxygenase activity, and at least one regulatory sequence that allows the expression of the complement in a host cell.

30. (Currently Amended) The host cell of claim [[30]] 29 wherein the host cell is selected from the group consisting of yeast, bacteria, insect and plant seed cells.

31. (Previously Presented) A transgenic plant seed cell comprising:

- (a) a chimeric gene comprising an isolated nucleic acid molecule having the sequence of SEQ ID NO:1;
- (b) the complement of an isolated nucleic acid molecule which hybridizes under high stringency conditions to a nucleotide sequence having the sequence of SEQ ID NO:1, wherein said nucleic acid molecule encodes a protein having at least 90% identity to SEQ ID NO:2 and wherein said protein has epoxygenase activity, and at least one regulatory sequence that allows the expression of the complement in a host cell;
- (c) a vector comprising an isolated nucleic acid molecule having the sequence of SEQ ID NO:1, or
- (d) a vector comprising the complement of an isolated nucleic acid molecule which hybridizes under high stringency conditions to a nucleotide sequence having the sequence of SEQ ID NO:1, wherein said nucleic acid molecule encodes a protein having at least 90% identity to SEQ ID NO:2 and wherein said protein has epoxygenase activity, and at least one regulatory sequence that allows the expression of the complement in a host cell.

32. (Withdrawn Previously Presented) A method for producing delta-12 epoxy fatty acids which comprises:

- (i) transforming a host cell with a chimeric construct comprising:
 - (a) a chimeric gene comprising an isolated nucleic acid molecule having the sequence of SEQ ID NO:1;
 - (b) the complement of an isolated nucleic acid molecule which hybridizes under stringent conditions to a nucleotide sequence having the sequence of SEQ ID NO:1, wherein said nucleic acid molecule encodes a protein having at least 90% identity to SEQ ID NO:2 and wherein said protein has epoxygenase activity,

and at least one regulatory sequence that allows the expression of the nucleic acid in a host cell,

(c) a vector comprising an isolated nucleic acid molecule having the sequence of SEQ ID NO:1; or

(d) the vector comprising the complement of an isolated nucleic acid molecule which hybridizes under high stringency conditions to a nucleotide sequence having the sequence of SEQ ID NO:1, wherein said nucleic acid molecule encodes a protein having at least 90% identity to SEQ ID NO:2 and wherein said protein has epoxygenase activity, and at least one regulator sequence that allows the expression of the nucleic acid in a host cell; and

(ii) growing the transformed host cells of step (i) under conditions that are suitable for expression of the nucleic acid molecule encoding the delta 12-epoxygenase, wherein the expression results in production of altered levels of fatty acid modifying enzyme in the transformed host cell.

33. (Withdrawn Previously Presented) The method of claim 32 in which the cell is a plant seed cell.

34. (Withdrawn Previously Presented) The method according to claim 33 comprising the additional step of

(iii) regenerating the cell obtained by step (ii) into a plant.

35. (Withdrawn Previously Presented) A method for producing a delta 12-epoxyenase enzyme comprising the following steps:

(i) transforming a microbial, yeast, or plant seed cell with a chimeric gene comprising an isolated nucleic acid molecule having the sequence of SEQ ID NO:1 or the complement of an isolated nucleic acid molecule which hybridizes under stringent conditions to a nucleotide sequence having the sequence of SEQ ID NO:1, wherein said nucleic acid molecule encodes a protein having at least 90% identity to SEQ ID NO:2 and wherein said protein has epoxygenase activity, and at least one regulatory sequence that allows the expression of the nucleic acid in a host cell;

(ii) growing the transformed cells obtained from step (i) under conditions that results in expression of the delta 12-epoxygenase enzyme.

36. (Withdrawn Previously Presented) The method of claim 38 wherein the isolated nucleic acid encodes a *Stokesia laevis* delta 12-epoxygenase enzyme.

37.(New) An isolated host cell comprising:

- (a) an isolated nucleic acid molecule having the sequence of SEQ ID NO:1;
- (b) the complement of an isolated nucleic acid molecule which hybridizes under high stringency conditions to a nucleotide sequence having the sequence of SEQ ID NO:1, wherein said nucleic acid molecule encodes a protein having the sequence of SEQ ID NO: 2 and wherein said protein has epoxygenase activity, and at least one regulatory sequence that allows the expression of the complement in the host cell;
- (c) a vector comprising an isolated nucleic acid molecule having the sequence of SEQ ID NO:1, or
- (d) a vector comprising the complement of an isolated nucleic acid molecule which hybridizes under high stringency conditions to a nucleotide sequence having the sequence of SEQ ID NO:1, wherein said nucleic acid molecule encodes a protein having the sequence of SEQ ID NO: 2 and wherein said protein has epoxygenase activity, and at least one regulatory sequence that allows the expression of the complement in a host cell.